

AMENDMENTS TO THE CLAIMS

Claims 1-34 (Cancelled)

35. (New) A method for extracting manganese from a multi-component solution, comprising:

- a) contacting the multi-component solution with a reagent to create a reaction solution, wherein the reagent comprises a quaternary ammonium compound, a hydrogen ion exchange reagent and an organic solvent (QL reagent); and
- b) removing one or more non-manganese impurities from the reaction solution to create an impurity depleted reaction solution; and
- c) extracting manganese from the impurity depleted reaction solution.

36. (New) The method of claim 35, wherein the pH of the solution remains constant.

37. (New) The method of claim 35, wherein step (b) comprises stripping the reaction solution by contacting the reaction solution with an acid; oxidizing and precipitating one or more of the impurities in the reaction solution; and removing the oxidized and precipitated impurities from the reaction solution to create an impurity depleted reaction solution.

38. (New) The method of claim 37, wherein the acid comprises a non-oxidizing acid.

39. (New) The method of claim 37, wherein calcium is extracted from the reaction solution during the stripping step.

40. (New) The method of claim 35, wherein calcium is extracted from the multi-component solution in a further step comprising: introducing manganese-rich strip solution to the reaction solution; displacing calcium from the reaction solution; and scrubbing the displaced calcium from the solution.

41. (New) The method of claim 40, wherein the manganese-rich strip solution contains an organic phase/aqueous phase (O/A) ratio between 5-20.

42. (New) The method of claim 35, wherein the multi-component solution comprises geothermal brine.

43. (New) The method of claim 42, wherein the geothermal brine contains zinc which is removed from the multi-component solution through a step comprising: contacting the multi-component solution with a reagent to create a mixture, wherein the reagent comprises a quaternary ammonium compound and a hydrogen ion exchange reagent; contacting the mixture with pure H₂O; and separating the zinc from the mixture.

44. (New) The method of claim 35, wherein a phase modifier is contacted with the reaction solution in step (a).

45. (New) The method of claim 35, wherein the impurity depleted reaction solution comprises manganese chloride.

46. (New) The method of claim 35, wherein in step (c) the impurity depleted reaction solution is combined with an acid to produce an electrolyte bath.

47. (New) The method of claim 46, wherein the acid is sulfuric acid or hydrochloric acid.

48. (New) Purified electrolytic manganese dioxide produced by the method of claim 35.

49. (New) A method for extracting manganese from a composition containing an impurity, comprising:

- a) contacting a composition containing manganese and one or more impurities with a QL reagent to create a reaction solution;
- b) contacting the reaction solution with an acid;
- c) oxidizing and precipitating one or more of the impurities in the reaction solution;
- d) removing the oxidized and precipitated impurities from the reaction solution to create an impurity depleted reaction solution; and
- e) applying an electric current to the impurity depleted reaction solution and removing the manganese therefrom.

50. (New) The method of claim 49, wherein the QL reagent comprises a quaternary ammonium compound, a hydrogen ion exchange reagent and an organic solvent.

51. (New) The method of claim 49, wherein the acid is a non-oxidizing acid.

52. (New) The method of claim 49, wherein all components of step (a) are performed under anoxic conditions.

53. (New) Purified electrolytic manganese dioxide produced by the method of claim 49.

54. (New) A method for extracting manganese from an multi-component solution, comprising the steps of:

a) obtaining a zinc and calcium depleted hydrochloric acid solution containing manganese and one or more impurities;

b) removing the one or more impurities from the solution by oxidizing the impurities, such that the impurities precipitate leaving a supernatant containing manganese chloride; and

c) electrowinning the supernatant in a hydrochloric acid bath, such that electrolytic manganese dioxide forms a deposit.

Application No.: Not yet assigned

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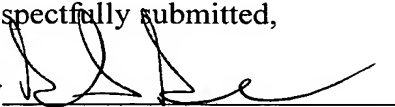
The present amendment cancels claims 1-34 and adds claims 35-54. Support for the new claims can be found throughout the specification and claims as originally filed.

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicants petition for any required relief including extensions of time and authorize the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. 144092000401.

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Respectfully submitted,

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